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(12) **United States Patent**
So

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(54) **CAN OPENER**

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(52) **U.S. Cl.** **30/418**; 30/416; 30/426
(58) **Field of Search** 30/410, 416, 417, 30/418, 422, 425, 426, 434, 440, 441

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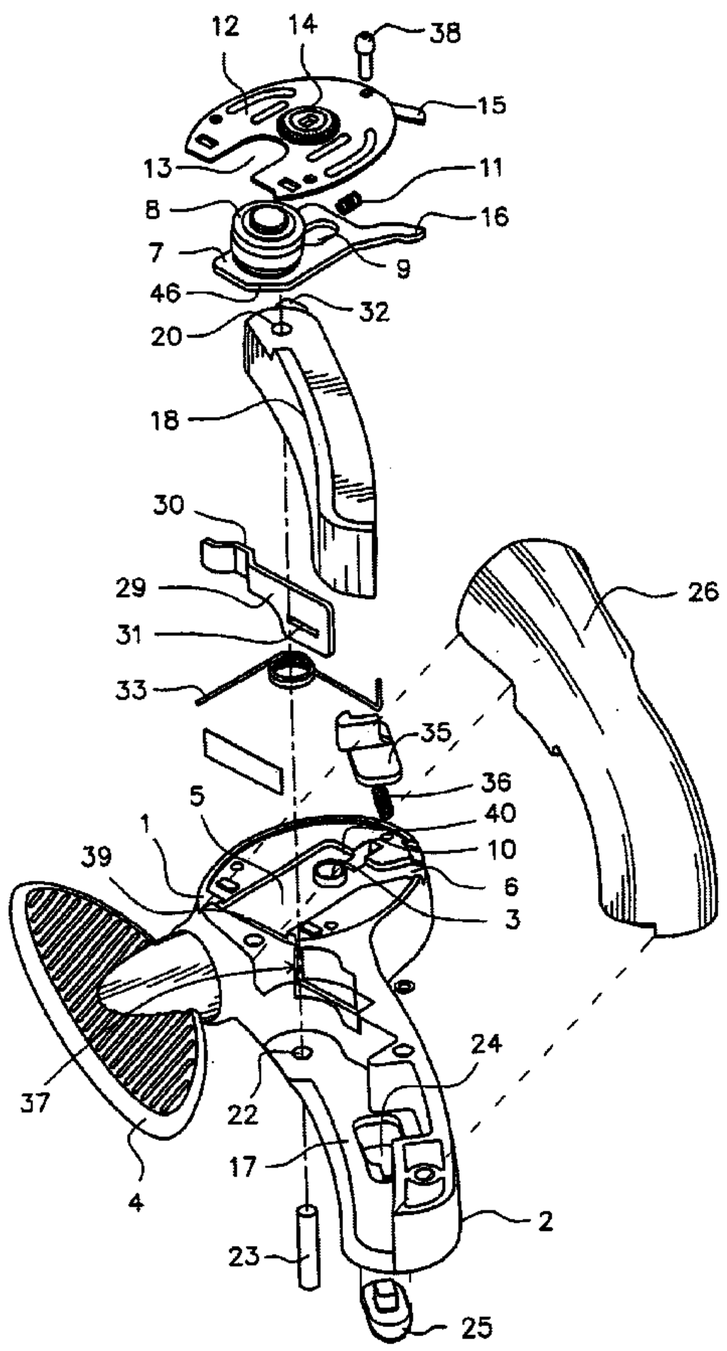
(57) **ABSTRACT**

A can opener includes a body with a handle, a traction wheel rotatably mounted on the body, an operating element for turning the traction wheel, and a cutter. The cutter is moveable between an inoperative position for receiving a rim of a can between the traction wheel and cutter, and an operative position for engaging said rim of the can between the traction wheel and cutter. A cam with a lobe engages the cutter and moves it between the inoperative and operative positions. The cam is operated by a lever.

13 Claims, 5 Drawing Sheets



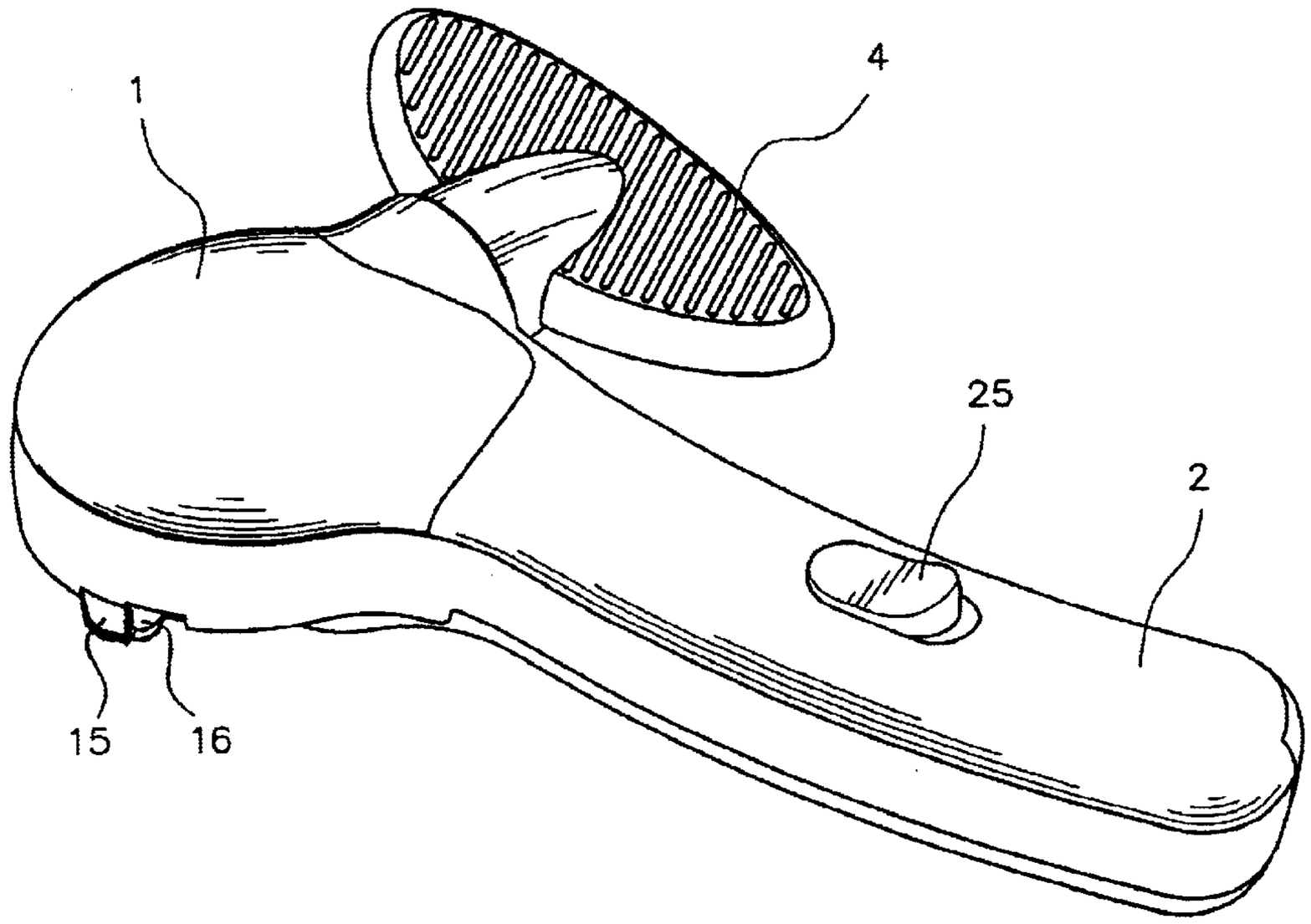


Figure 1

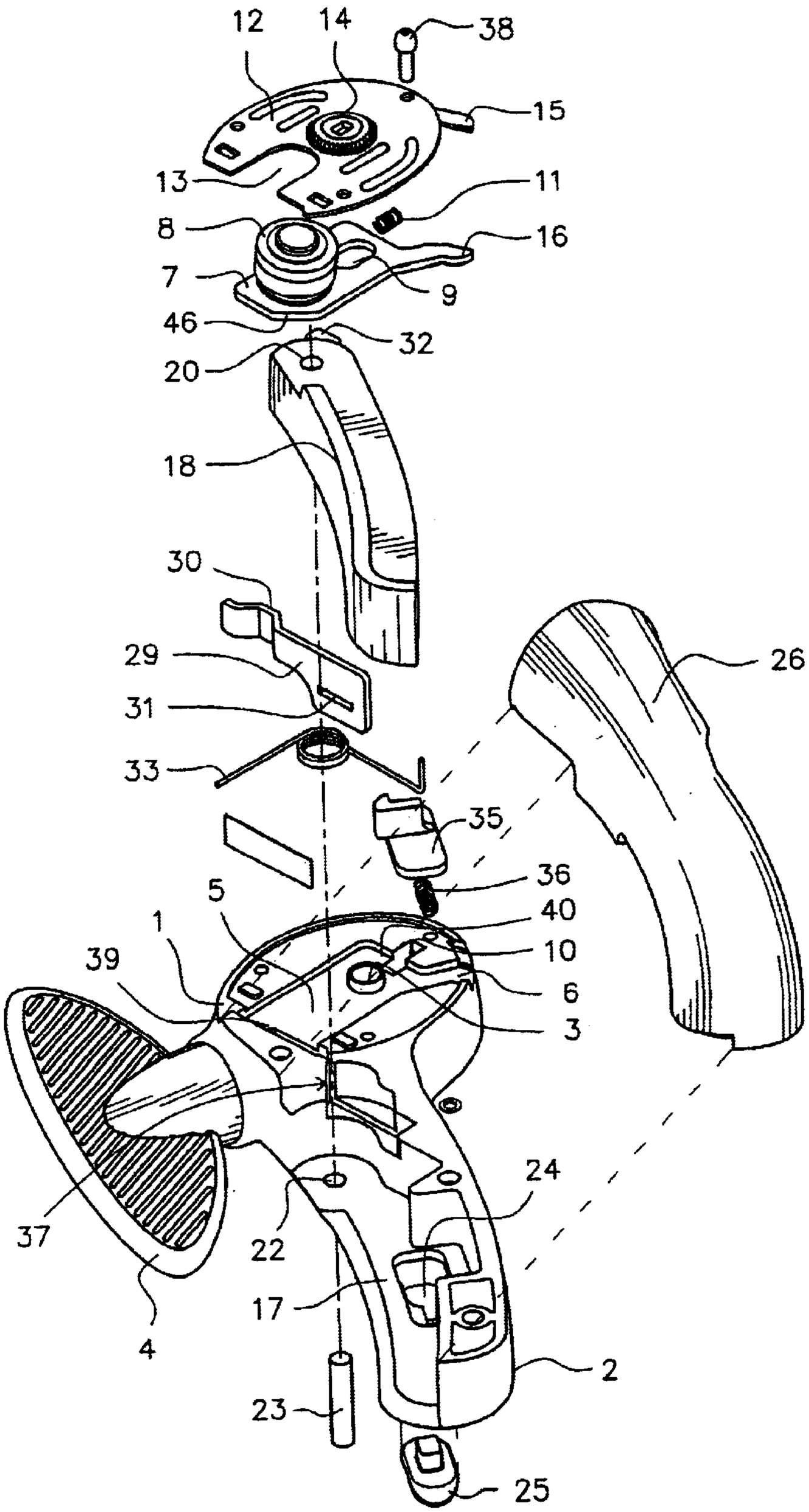

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Figure 2

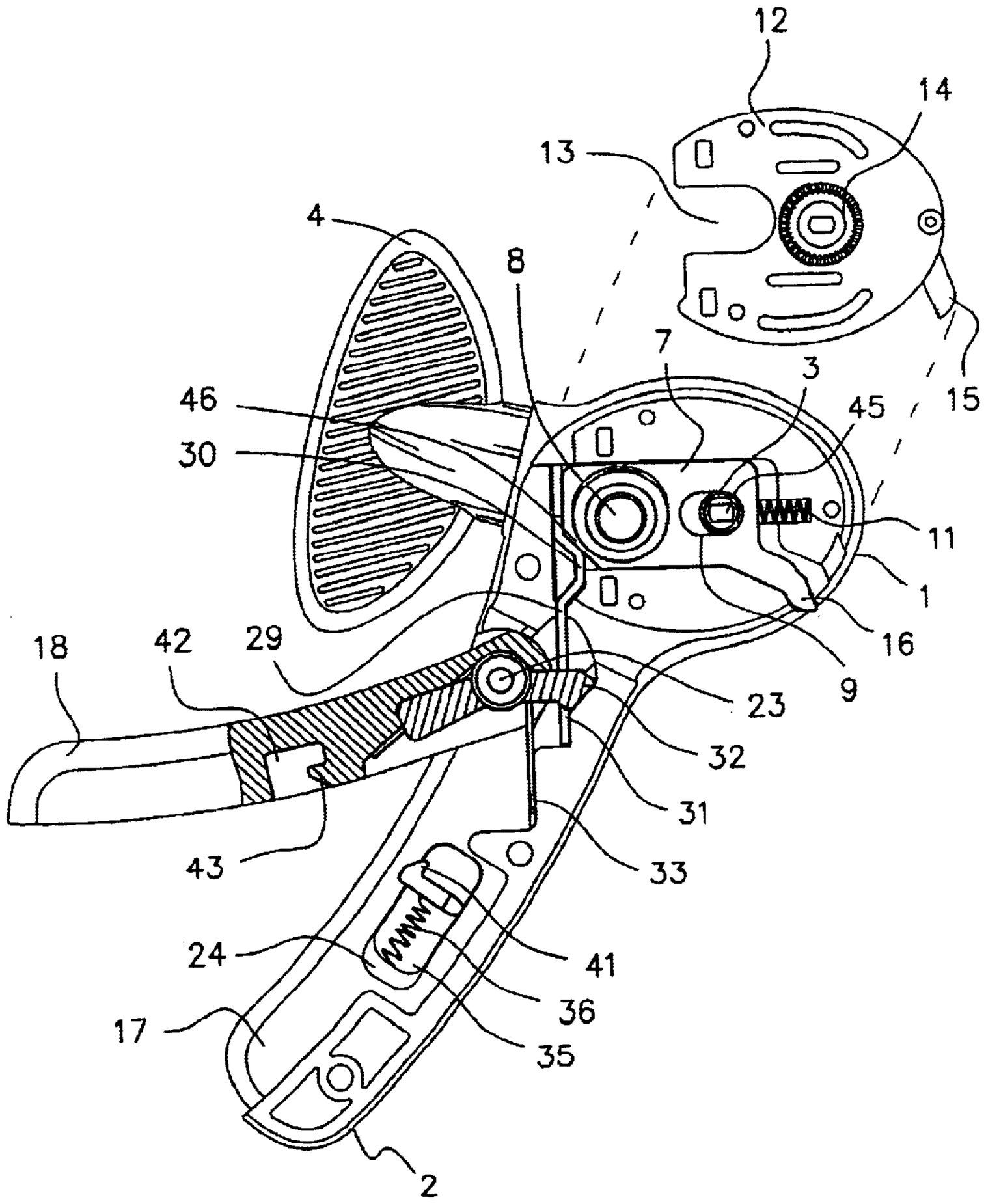
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Figure 3

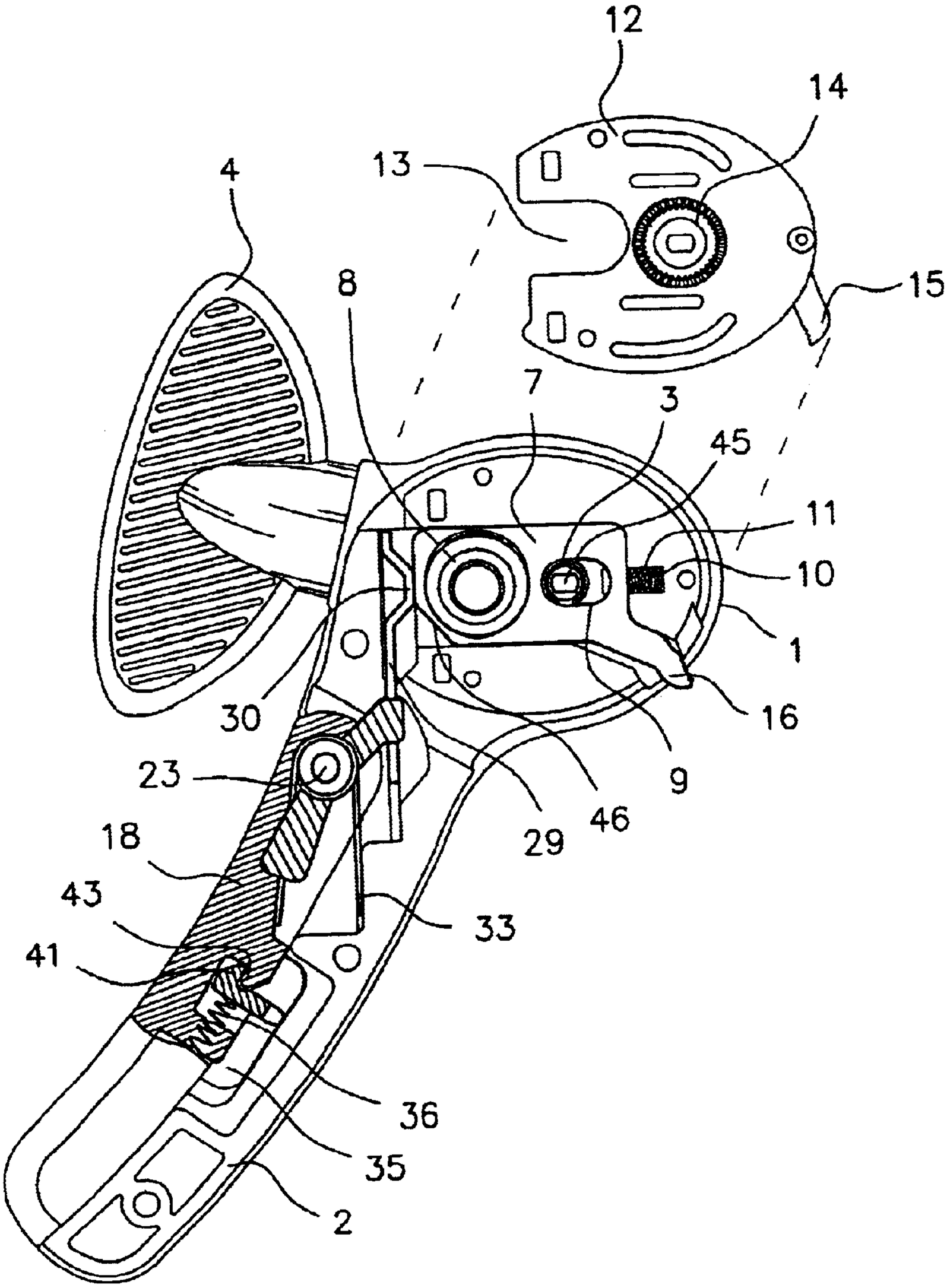

Figure 4

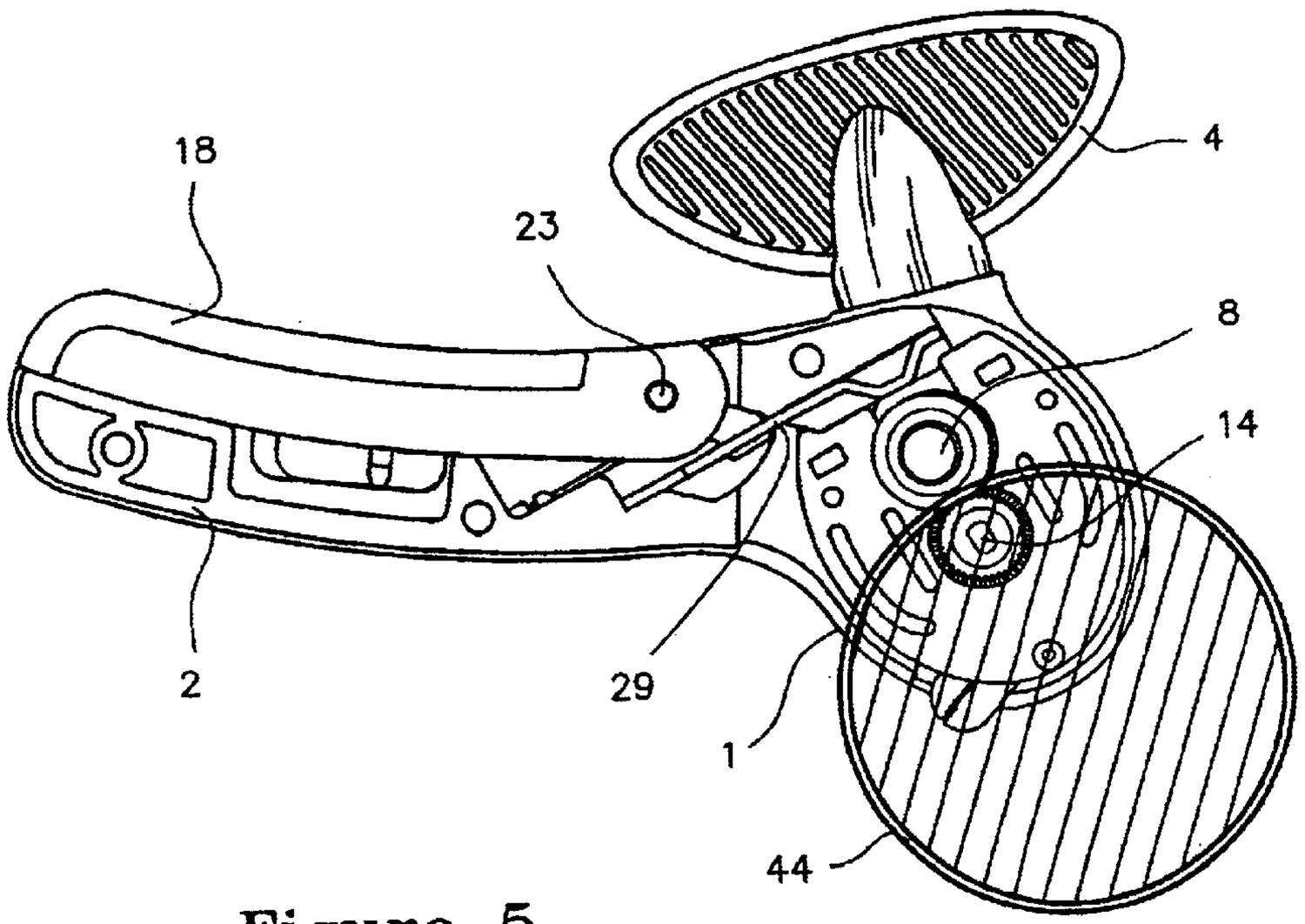

Figure 5

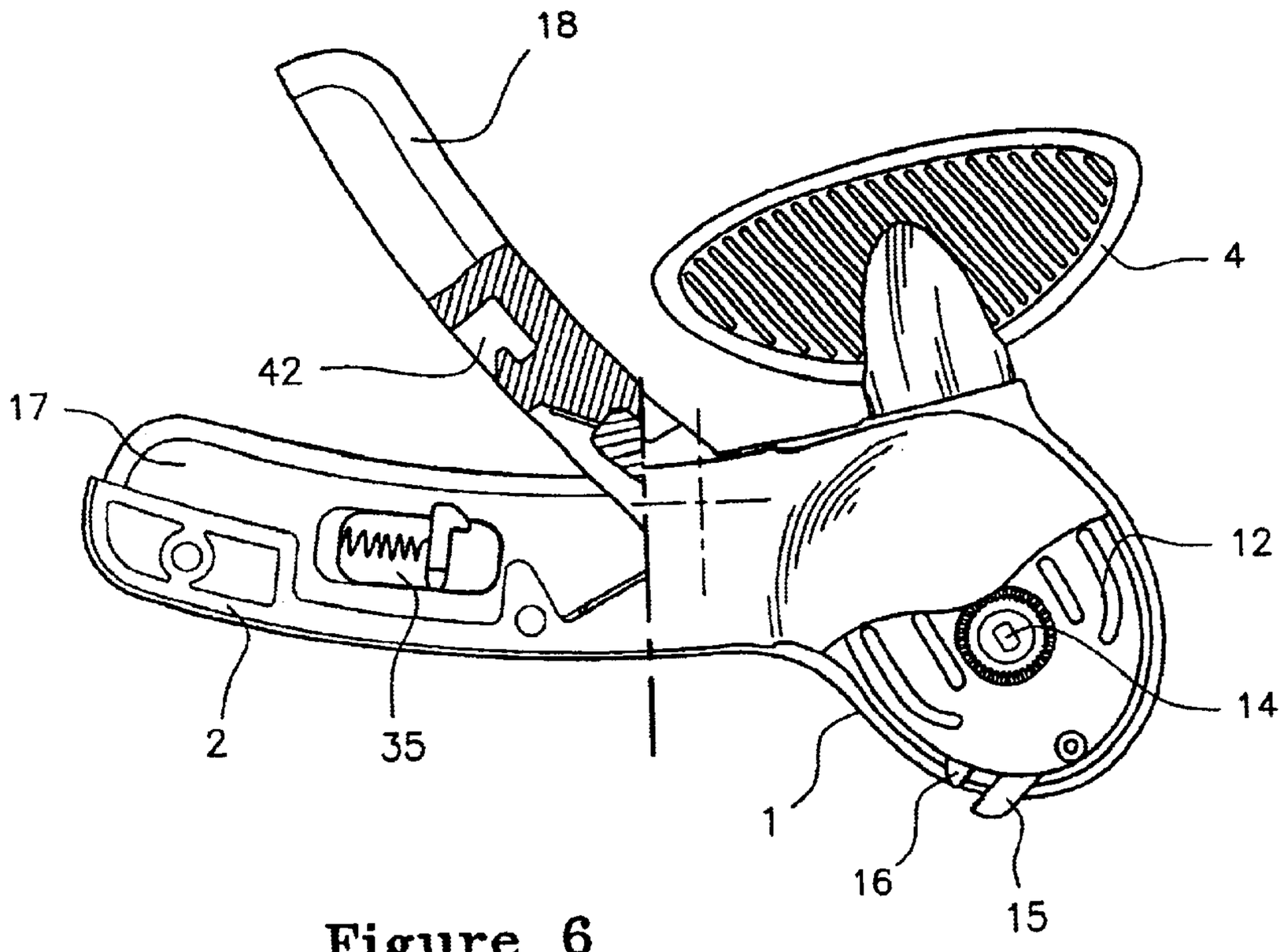

Figure 6

CAN OPENER

BACKGROUND TO THE INVENTION

1. Field of the Invention

The invention relates to manually operable can openers, and in particular to can openers of the laterally-cutting type

2. Background Information

Manually operable can openers have been known for many years and may be broadly categorised into three types: a first type having a cutter blade which cuts directly into the top wall of a can, a second type having a cutter blade which cuts into the side wall of the can below the rim, and a third type having a cutter blade which cuts partially into the rim of the can.

The second and third types can be collectively referred to as laterally-cutting types, which are used to remove the end of a can at or below the can rim. Applicant's earlier patents GB 2334939 and GB 2341378 (and corresponding U.S. Pat. No. 6,058,613), the contents of which are considered included as if explicitly set forth herein, describe a can opener that is of this laterally-cutting type.

A typical laterally-cutting type can opener comprises first and second elongate operating elements pivotally connected to each other. Each operating element has a handle portion. One operating element has a rotatable traction wheel pivotally opposite its handle, and the other operating element has a cutter blade pivotally opposite its handle. Movement of the handles relative to each other moves the traction wheel and cutter blade between an inoperative position to receive a rim of a can therebetween and an operative position in which the traction wheel and cutter blade engage the rim of the can During operation of the can opener the two handles must be firmly held together in one hand while an operating handle is turned (to move the can rim between the cutter and traction wheel) with the other hand.

Two problems with the above can opener are that the best position for holding the handles together is often not the most comfortable position for using the opener, and it can be difficult for persons with a weak grip to squeeze the handles together with sufficient force during operation of the can opener to properly engage the can rim between the cutter and traction wheel.

It is an object of the present invention to overcome or ameliorate these problems.

SUMMARY OF THE INVENTION

According to a first aspect of the invention there is provided a can opener including:

a body with a handle,

a traction wheel rotatably mounted on the body,

an operating element for turning the traction wheel,

a cutter movable between an inoperative position for receiving a rim of a can between the traction wheel and cutter, and an operative position for engaging said rim of the can between the traction wheel and cutter,

a cam with a lobe for engaging the cutter and moving it between the inoperative and operative positions, and

a lever for operating the cam.

Preferably, the handle has a cavity into which the level is received when the cutter is in the operative position.

Preferably, the can opener includes a lock for releasably securing the lever in the recess.

Preferably, the cutter is biased in the inoperative position.

Preferably, the cam comprises an elongate member with the lobe proximate a first end, a pivot for the lever is adjacent a second end of the cam, and the lever has a tab engaging the elongate member proximate the second end.

Preferably, the cutter comprises a carriage plate and cutter arid the lobe engages the carriage plate.

Preferably, the can opener includes a first jaw portion disposed on the body, and a second jaw portion disposed on the carriage plate.

Preferably, the can opener is of the lateral cutting type.

Further aspects of the invention will become apparent from the following description, which is given by way of example only.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention will now be described with reference to the accompanying drawings in which:

FIG. **1** is an perspective view of a can opener according to the invention,

FIG. **2** is an exploded view of the can opener,

FIG. **3** is a first sectional view through the can opener,

FIG. **4** is a second sectional view through the can opener,

FIG. **5** illustrates a rim of a can engaged by the can opener, and

FIG. **6** illustrates open jaws on the can opener.

DESCRIPTION OF THE PREFERRED EXAMPLES

Referring to FIGS. **1** to **4**, a can opener comprises a body portion **1** with an integrally formed handle **2** extending therefrom within the body **1** is a 90-degree gear with its output shaft **45** (not shown in FIG. **2**) extending through an aperture **3** in the face of body **1**. The input of the 90-degree gear is an operating handle **4** for manually operation of the output shaft **45**. The output end of the output shaft **45** is keyed for engagement with a traction wheel **14**.

The face of body **1** has a rectangular recess **5** with a channel **6** extending from a corner of the recess **5** to the edge of body **1**. A rectangular carriage plate **7** locates within recess **5** The carriage plate **7** is longitudinally shorter than the recess **5** so that it can move longitudinally in the recess **5** from a first position proximate recess first end **39** to second position proximate recess second end **40**. At recess second end **40** is a smaller cylindrical recess **10** that receives a spring **11** for biasing the carriage plate **7** in the first position.

A corner of carriage plate **7**, adjacent top edge **39** of recess **5**, is cut away to form a bevelled edge **40**.

A cutter wheel **8** of known type is rotatably mounted on carriage plate **7** and moves between first and second positions as carriage plate **7** so moves. An elongate slot **9** in carriage plate **7** accommodates aperture **3** and the output shaft **45** therethrough. An arm extending from a corner of the carriage plate **7** has a first jaw **16** at its end. The arm locates within channel **6** of recess **5** and the jaw **16** extends out of channel **6** and past the edge of body **1**.

Along the top edge **39** of recess **5** is a deep elongate slot **37** within body **1**. A cam plate **29** locates within slot **37** and is slideable longitudinally within the slot **37**. Proximate a first end of the cam plate **29** is a lobe **30** which extends into recess **5** adjacent its top edge **39**. The lobe **30** moves transversely along the top edge **30** of recess **5** as the cam plate **29** moves longitudinally within slot **37**. When the cam plate **29** is in a first position within slot **37** the lobe **30** is adjacent the bevelled edge **46** of carriage plate **7** which is in its first position within recess **5**. This position is illustrated in FIG. **3**. When the cam plate **29** is moved longitudinally within slot **37** the lobe **30** moves transversely along the top edge **39** of recess **5**. The lobe **30** rides up bevelled edge **46** of carriage plate **7** moving it longitudinally within recess **5** to its second position adjacent second end **40** of recess **5**, as illustrated in FIG. **4**.

The handle **2** has a cavity **17** into which a lever **18** is received. In the illustrated embodiment a side **26** of handle

2 is shown separately formed. During assembly of the can opener this side **26** is firmly secured to the handle **2** by glue or screw fixings. In alternative embodiments the handle is formed in one piece.

At the proximal end of the handle **2** is a first bore **22**. Bore **22** and a through hole **20** in lever **18** receives pivot pin **23** The lever **18** pivots between an open position, as shown in FIG. **3**, and a closed position, as shown in FIG. **4**. A spring clip **33** at the pivot **23** biases the lever **18** in the open position. The handle **2** has an opening **24** in the wall of cavity **17** through which a lock is located.

The lock comprises an operating switch **25** on the outer surface of the handle **2**, and a catch **35** within cavity **17**. A lock spring **36** biases the switch **25** and catch **35** in a locking position. The underside of lever **18** has a cavity **42** into which the catch **35** locates when the lever **18** is in the closed position. A tab **41** of catch **35** engages a lip **43** of cavity **42** to releasably secure the lever **18** in the closed position. The lock is released by moving the switch **25** against the lock spring **36** bias to disengage tab **41** from lip **43**.

The lever **18** has a tab **32** at its pivot end which engages a slot **31** in the second end of cam plate **29**. The tab **32** acts as a linkage to move cam plate **29** longitudinally within slot **37** as lever **18** moves between its open and closed positions.

A cover plate **12** locates over the face of body **1** and is secured by a plurality of screws **38**. The cover plate **12** bears a traction wheel **14** which engages with the keyed output end of output shaft **45** for rotation via operating element **4**. The cover plate **12** has a cutaway portion **13** extending inwardly from its top edge. Cut away portion **13** accommodates movement of cutter wheel **8**, relative to traction wheel **14**, as carriage plate **7** moves within the recess **5** underneath the cover plate **12**.

Referring to FIG. **5**, when carriage plate **7** is in its first position proximate top edge **39** of recess **5** the cutter wheel **8** is in an inoperative position whereby a can rim **44** may he located between the cutter wheel **8** and traction wheel **14**. When lever **18** is moved into cavity **17** of handle **2**, the carriage plate **7** is engaged by lobe **30** of cam **29** and moves to its second position proximate recess second end **40**. In this position the cutter wheel **8** is in an operative position wherein the can rim **44** is engaged between the cutter wheel **8** and traction wheel **14**. Turning operating handle **4** causes the can rim **44** to move between the cutter wheel **8** and traction wheel **14** slicing the rim of the can.

Cover plate **12** has a second jaw portion **15** at its edge. The second jaw **15** is arranged to be proximate the edge of channel **6** where the first jaw portion **16** extending from carriage plate **7** extends passed the edge of body **1**. The two jaw portions **15**, **16** form a gripping member which is used to grip the rim **44** of the can after cutting with the can opener so that the can end can be removed effortlessly and safely. Because the first jaw **16** is a part of carriage plate **7** the jaws **15**, **16** move from an open position, as shown in FIG. **6**, when carriage plate **7** is in its first position to a closed position, as shown in FIG. **1**, when the carriage plate **7** is in its second position.

In the preferred embodiment a cam plate **29** is utilised. The cam plate **29** is moved longitudinally by the lever **18** and a cam lobe **30** engages carriage plate **7** to move it between its first and second positions. In an alternative embodiment the pivot **23** of lever **18** is located adjacent the top edge **39** of recess **5**. An oval cam with a lobe is mounted about pivot **23** and operation of lever **18** engages the lobe against the top of carriage plate **7** for movement between its first and second positions.

Where in the foregoing description reference has been made to integers or elements having known equivalents then such are included as if individually set forth herein.

Embodiments of the invention have been described, however it is understood that variations, improvements or modifications can take place without departure from the spirit of the invention or scope of the appended claims.

What is claimed is:

1. A can opener including:

a body with a handle;

a traction wheel rotatably mounted on the body;

an operating element for turning the traction wheel;

a cutter movable between an inoperative position for receiving a rim of a can between the traction wheel and the cutter, and an operative position for engaging said rim of the can between the traction wheel and cutter;

a cam with a lobe for engaging the cutter and moving it between the inoperative and operative positions; and

a lever for operating the cam.

2. The can opener of claim **1** in which the handle has a cavity into which the lever is received when the cutter is in the operative position.

3. The can opener of claim **2** including a lock for releasably securing the lever in the cavity.

4. The can opener of claim **1** in which the cutter is biased in the inoperative position.

5. The can opener of claim **1** in which the cam comprises an elongate member with the lobe proximate a first end, a pivot for the lever is adjacent a second end of the cam, and the lever has a tab engaging the elongate member proximate the second hand.

6. The can opener of claim **1** in which the cutter comprises a carriage plate with a cutter wheel and the lobe engages the carriage plate.

7. The can opener of claim **6** including a first jaw portion disposed on the body, and a second jaw portion disposed on the carriage plate.

8. A can opener including:

a body with a handle;

a traction wheel rotatably mounted on the body;

an operating element for turning the traction wheel;

a cutter movable between an inoperative position for receiving a rim of a can between the traction wheel and the cutter, and an operative position for engaging said rim of the can between the traction wheel and cutter;

a cam having a slider with a lobe for engaging the cutter and moving it between the inoperative and operative positions; and

a lever with a tab for engaging the slider and operating the cam.

9. The can opener of claim **8** in which the handle has a cavity into which the lever is received when the cutter is in the operative position.

10. The can opener of claim **9** including a lock for releasably securing the lever in the cavity.

11. The can opener of claim **8** in which the cutter is biased in the inoperative position.

12. The can opener of claim **8** in which the cutter comprises a cutter wheel rotatably mounted on a carriage plate.

13. The can opener of claim **12** including a first jaw portion disposed on the body, and a second jaw portion disposed on the carriage plate.

* * * * *